Appendix A Cultural Resource Assessment

March 2, 2000

Mr. Gene Lynard – KEC-4
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Cultural Resource Assessment of Bonneville Power Administration Tanner Tap Transmission Line Project at North Bend, King County, Washington

Dear Mr. Lynard:

This letter reports the results of a cultural resource assessment of the proposed Bonneville Power Administration (BPA) Tanner Tap Transmission Line Project located at North Bend, in King County, Washington. BPA plans to construct 4.5 miles of new 115,000-volt (115-kV) transmission line, which will tap Puget Sound Energy's (PSE) existing Snoqualmie-Lake Tradition No. 1 115-kV Transmission Line and energize Tanner Electric Cooperative's (Tanner Electric) proposed 115/12.5-kV substation in the City of North Bend. BPA is conducting an environmental review of the proposed action to comply with the National Historic Preservation Act of 1960 and the National Environmental Policy Act of 1969, as amended, as well as other environmental laws and regulations.

BPA proposes to construct the transmission line on private and public land in Sections 35 and 36 of T24N, R7E, and Sections 1, 4, 5, 6, and 31 in T23N, R8E. It is shown on the enclosed map. A 50-foot right-of-way is needed on private land, a franchise agreement on State and County right-of-way, and a street use permit on City right-of-way. Where practical, from the tap point (Section 36, T24N, R7E) south approximately 0.5 mile, BPA would utilize the western 27.5 feet of the existing 150-foot right-of-way that exists in the area (Echo Lake-Monroe 500-kV Transmission Line right-of-way). As a connected action, Tanner Electric would construct a 115-kV/12.5-kV substation on a 5-acre parcel (owned in fee by Tanner Electric) located off Alm Way in Section 4, T23N, R8E. The survey also included two alternatives at the east end of the line, east of the crossing of SE 394th Place. One alternative follows North Bend Way for about 0.5 mile and then turns south to the substation site. The other alternative runs 0.5 mile from the junction of Alm Way and North Bend Way (Old Highway 10-Sunset Highway), along the north shoulder of Alm Way to the proposed substation.

The Area of Potential Effect (APE) for cultural resources consists of an area of approximately 50-feet-wide along the route, including the North Bend Way and Alm Way Alternatives and the proposed substation parcel. This totals about 28.5 acres. Cultural resource assessment work included both background research at the State Office of Archaeology and Historic Preservation in Lacey and a pedestrian survey of the APE. In addition, BPA wrote to the Snoqualmie, Tulalip, and Muckleshoot Indian tribes to ask if they had concerns about potential Project effects on traditional cultural places or other resources.

The Project Area has potential for archaeological and other cultural resources because of its long history of human use. It is located within the territory of the Snoqualmie Indians who have long used the Snoqualmie River valley and had a village on the prairie above Snoqualmie Falls. Particularly on that prairie, the Snoqualmie Indians dug roots such as camas, bracken fern, and wild tiger lily, and gathered plant shoots and berries. They also hunted animals and birds, emphasizing deer and mountain goat. Places in and around the prairie have legendary significance to the Snoqualmie Indians (Corliss 1972). This includes a legendary site called the "Swing," which is located about 900 feet from the APE. Along the west bank of the river's South Fork, about one mile below North Bend, Waterman (1920) reports that the Snoqualmie formerly gathered for ceremonial performances and potlatches.

The Project Area is located near a historical route over Snoqualmie Pass, which included early Indian trails and the Snoqualmie Pass Wagon Road (Bagley 1929; Hill 1994). Historical occupants constructed Fort Smalley to defend themselves against the Indian uprising that occurred in 1856 near the present Project Area. The 1860s donation land claims of Joseph and Lucinda Fares and Prudence Davis Rutherford and her family are located in the Project Area. Early settler Jeremiah Borst bought these lands in the early 1880s to make up his Tollgate Farm (where a tollgate on the Snoqualmie Pass Wagon Road was located). This area has a long history of farming use, which includes dairying. Early transportation included a railroad and the Sunset Highway, which passed through the Project Area and over Snoqualmie Pass.

HRA Research Archaeologist Trent DeBoer conducted the background research was conducted during December 1999. This work revealed the locations of some archaeological sites and historical structures as listed in Table 1. The results of the background research confirmed the sensitive nature of the Project Area.

HRA Project Archaeologist James Carter conducted the field survey on January 20-21, 2000. He walked the length of the transmission line right-of-way, following a line that had been brushed and staked by David Evans and Associates (DEA). Mr. Carter spoke with DEA surveyor Scott Stoughton on January 21 to better understand the route and the concerns of local landowners. Mr. Carter documented survey methods, conditions, and results in a field book and on a photocopy of a large-scale project map. He also recorded a number of photographs of survey conditions and findings with a digital camera.

The survey passed through a number of areas previously disturbed for road and other construction that afforded good visibility of the soils. Road cuts and stream banks, for example, afforded good exposures of soils in the APE. The archaeologist made 50x50-cm shovel scrapes at intervals of 20-30 meters as needed to create mineral soil exposures. Extensive areas of fill and some of cut occur along North Bend Way. The short Alm Way alternative had been heavily disturbed from road and railroad construction.

Table 1 Previously Recorded Cultural Resources

Site No./Name	**Site Type**	**Source**	**Distance from Transmission Line**
45-KI-454 Tollgate Farm Survey Site No. 1	Prehistoric lithics and fire-cracked rock	OAHP Site Form; Podzorski & Blukis Onat 1997; Reanier 1997	About 1,500 ft
45-KI-455H Tollgate Farm, Fort Smalley, Fares' Homestead, Fisk House	Historic farm complex including buildings and prehistoric and historic archaeological remains	OAHP Site Form; Bean 1985a,b; Podzorski & Blukis Onat 1997; Reanier 1997	About 800 ft (farm complex)
45-KI-458 Meadowbrook Farm	Prehistoric lithics and fire-cracked rock	OAHP Site Form	About 2,000 ft
Snoqualmie Legendary site, the "Swing"	Legendary Site	OAHP Site Form for 45-KI-458	About 897 ft
17-62; 17-63 Highway bridges and Culvert Associated with Sunset Highway (Hwy 10)	Four highway bridges and a culvert, dating to 1941	OAHP Site form	Adjacent to the APE

The field archaeologist noted a number of springboard-cut stumps, but only one associated artifact, which consisted of an approximately 25-foot length of 0.5-inch twisted-strand metal logging cable that appears to date to the early 20th century. This isolate was located about 0.65 mile south of the north end of the APE. Survey along North Bend Way noted two of the previously recorded 1941 concrete highway bridges and an associated culvert. Just southeast of the City of Snoqualmie, at SE 394th Place, the route crosses the tracks of the Seattle Lake Shore and Eastern Railway, which was originally constructed in 1889 and later became part of the Northern Pacific Railway and the Burlington Northern Railroad. Subsequently, the Northwest Railway Museum acquired this line and currently operates it.

Survey at the east end of the project area included a 5-acre parcel to be used for the Tanner Substation; coverage in 20-m transects, with 50x50-cm shovel scrapes every 20 meters as needed, revealed no cultural resources. The area is located above the 100-year flood zone, and the existence of a B-horizon about 10-20 cm beneath the ground surface indicated that soil development was proceeding slowly. While buried cultural resources cannot be ruled out altogether, the potential for them appears to be low.

Cultural resources within the Project APE include the Seattle Lake Shore and Eastern Railway line crossing at SE 394th Place. Based on its long history in the development of the area, this line is likely to be eligible for listing in the National Register of Historic Places (personal conversation with Greg Griffith, State Office of Archaeology and Historic Preservation, February 4, 2000). The Northwest Railway Museum expressed a preference for the Alm Way alternative, stating that the North Bend Way alternative would affect the view of Mt. Si by railroad riders, that the alternative required removal of a number of trees, and that crossing the railway right-of-way would encumber railway maintenance. The City of North Bend and local residents also expressed concerns about tree removal effects on views and wildlife habitat.

BPA met with representatives of the Railway Museum, the City of North Bend, and King County Utilities to develop a compromise routing or "split alternative." This will use the western part of the North Bend Way alternative and the eastern part of the Alm Way alternative to protect the view of Mt. Si and minimize tree removal. BPA will also provide mitigation, which will involve some combination of limiting the tree cutback area, topping some trees instead of removing them, and/or replanting with native species. While the split alternative will cross the railway twice, transmission lines are common sights along railroads. The proposed transmission line should not unduly hamper railway maintenance or compromise its present use for tourism and not adversely affect the railroad as a potential National Register-eligible cultural resource.

Other resources include isolates such as springboard-cut stumps and a segment of logging cable; a site consists of structures associated with the old Sunset Highway (North Bend Way). HRA believes that the historical isolates are not eligible for listing in the National Register of Historic Places. Although we do not know whether the Sunset Highway is eligible for listing in the National Register, we believe that construction and operation of the Project would not adversely affect the highway bridges and culvert. While the Snoqualmie legendary site, the "Swing" is likely to be eligible for listing in the National Register, it is located almost 900 feet from the APE. Adding a single-pole transmission line along the roadway, where a distribution line already exists, should not affect the site.

As a result of the background research and field survey, HRA located no significant prehistoric or historic cultural resources that would be affected by construction, operation, and maintenance of the proposed BPA Tanner Tap Transmission Line and Substation. One or more of the Indian Tribes may respond to BPA's request for consultation. HRA recommends that BPA provide a copy of the cultural resources report to the Snoqualmie, Tulalip, and Muckleshoot Tribes for their review. This letter report should also be forwarded to the State OAHP for review and comment. The Weyerhaeuser lands representative has also requested a copy of the report.

If cultural resources are encountered during construction, activities that could disturb the remains should cease, and a BPA representative should contact Dr. Robert Whitlam of the State OAHP (360-407-0771) to arrange for evaluation and treatment of the remains.

I hope this information meets your needs. If you have any questions or comments, please call me at your convenience. HRA appreciates the opportunity to assist the Bonneville Power Administration.

Sincerely,

Gail Thompson, Ph.D.
Vice President

Attachments:
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Archaeological Survey Map

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Appendix B Environmental Noise Analysis

Bonneville Power Administration
Tanner Tap to Snoqualmie-Lake Tradition No. 1 Transmission Line

Environmental Noise Analysis

King County, WA

March 22, 2000

MFG Project 9498

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Introduction

The Bonneville Power Administration (BPA) is planning on constructing a 115 kilovolt (115-kV) transmission line in the Snoqualmie and North Bend vicinities. The new line will tie into an existing line near the Snoqualmie Ridge Business Park and travel approximately 4.5 miles to the new Tanner Electric Coop Substation. The new line will be adjacent to an existing 500-kV power line for approximately 3,000 feet, and will then turn east and follow I-90, North Bend Way, and Alm Way until terminating at the Tanner Substation.

Because the new line will not itself be a noise source, the primary noise issue related to the operation and maintenance of the power line is the effect on existing noise levels of removing trees and vegetation along the alignment. Along most of the power line alignment, approximately 50 feet (25 feet on each side of the power line) of trees and tall shrubs would be removed. In addition to this vegetation, additional Adanger@ trees, trees with the potential to fall into the power lines, would be removed. These Adanger@ trees are most often deciduous, generally cottonwoods.

The primary noise source related to the new substation would consist of a 115-kV transformer.

This noise analysis examines both the effect on the existing noise environment of the proposed vegetation removal and the substation noise.

Noise Regulations

The power line installation would occur in two jurisdictions, unincorporated King County and the City of North Bend. However, the power line is not anticipated to emit any audible noise, so the applicable noise limits for each jurisdiction do not pertain. Potential sound level increases from roadway sources due to removal of vegetation are not subject to any of the local noise regulations, so these potential increases are discussed in terms of potential impact due to the estimated increase in the sound level from existing sources.

The proposed Tanner Electric Coop Substation would be located in the City of North Bend, approximately 1,330 feet from its boundary with unincorporated King County. Noise from this source received in the city of North Bend is subject to North Bend's noise regulations. Noise from this source received in unincorporated King County is subject to King County's noise regulations.

North Bend Noise Limits - The substation would be located in the City of North Bend on land zoned for an employment park and would be surrounded by similarly zoned property. Both the noise source property and the receiving property would be classified as "Business" districts by the City of North Bend. According to Section 8.26.040 of North Bend's City Code, the maximum permissible sound level for a "Business" sound source affecting a "Business" receiving property is 60 dBA, day and night. Slightly further from the substation site would be land zoned for low-density residential use, considered a "Residential District" by North Bend's

City Code. The maximum permissible sound level for a "business" sound source affecting a "residential" receiving property is 57 dBA during daytime hours (7 a.m. to 10 p.m.) and 47 dBA at night (10 p.m. to 7 a.m.). However, according to Section 8.26.050.A of North Bend's City Code, electrical substations are not subject to the 10 dBA nighttime reduction. Therefore, sound from the substation affecting the nearest "Residential District" would be limited to 57 dBA, day and night.

King County Noise Limits - For substation noise received on land in unincorporated King County, the substation source would be classified as a "Class B EDNA". The nearest receiving property in unincorporated King County would be zoned as R-5, considered a "Rural District" by the King County Code. A Class B EDNA source affecting a Rural receiving location is limited by the King County Code to 55 dBA during daytime hours (7 a.m. to 10 p.m.) and 45 dBA at night (10 p.m. to 7 a.m.). However, according to Section 12.94.030 of the King County Code, electrical substations are exempt from the 10 dBA nighttime reduction. Therefore, sound from the substation affecting the nearest "Rural District" would be limited to 55 dBA, day and night.

Methodology

Noise concerns related to the installation of the power line voiced by potentially affected citizens focus on the potential increase in noise due to removal of trees along the power line alignment. Of primary concern is noise from traffic on North Bend Way and I-90. To provide substantial noise attenuation, trees and forested areas must be sufficiently dense and wide to act as an obstruction of the sound. For any obstruction to occur, the trees and underbrush must be dense enough to completely block any view of the noise source.

When the stand of trees is dense enough and wide enough, the noise is attenuated by several mechanisms. Low frequency noise is attenuated mostly by the root structures creating acoustically soft ground that absorbs the sound and otherwise disrupts the transmission path. Any existing attenuation due to this factor would remain in the future with or without the project, because other vegetation (i.e., shrubs and grasses) would remain. Mid-level frequencies are attenuated mostly by limbs and trunks and the deflection these random surfaces provide. The removal of trees would eliminate most of the larger limbs and trunks, thereby reducing any existing attenuation of the mid-frequencies. High frequency noise is attenuated mostly by leaves. This attenuation would occur for those frequencies where the wavelength of the noise is approximately the same length as the size of the leaf. Many of the trees being considered for removal are deciduous and do not have leaves year round. However, any existing attenuation of the higher frequency noise during the spring and summer months could be reduced with removal of the trees.

The amount of attenuation attributable to trees is highly debatable. Numerous studies and measurements have been conducted through the years, many of them yielding significantly different results. The new FHWA Traffic Noise Model (1998) uses methods outlined in the ISO 9613-2 standard to calculate noise attenuation due to forest and dense trees. This noise analysis

also uses the ISO 9613-2 procedure to estimate the potential increases in noise due to removal of the vegetation.

ISO 9613-2 estimates noise attenuation in each octave band for varying distances of dense foliage (Table 1). Dense foliage is defined as "sufficiently dense to completely block the view along the propagation path, i.e., it is impossible to see a short distance through the foliage." The attenuation values used in ISO 9613-2 were used in this analysis. The frequency spectrum of freeway noise used in the calculations that follow are from a direct measurement by MFG.

Table 1. Noise Attenuation through Dense Foliage

Octave band center frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Attenuation (dB, total) for d_f (distance through foliage) less than 10 meters (33 feet)	0	0	0	0	0	0	0	0
Attenuation (dB, total) for d_f between 10 and 20 meters (33 and 66 feet)	0	0	1	1	1	1	2	3
Attenuation (dB, per meter) for d_f between 20 and 200 meters (66 and 660 feet)	0.02	0.03	0.04	0.05	0.06	0.08	0.09	0.12
Maximum attenuation (dB) for d_f >= 200 meters (660 feet)	4	6	8	10	12	16	18	24

Potentially Affected Locations

Numerous potentially-affected residences are located near the proposed alignment of the new power line. Installation of the line would remove vegetation between a major noise source (generally a local roadway or I-90) and several of these residences. A description of the potentially-affected residences and the estimated reduction in tree-related noise attenuation follows.

Beginning of Project to SE 96th Way

There are no residences to be affected by the vegetation removal along the north-south alignment of the power line from the project beginning just south of Snoqualmie Parkway to the intersection with SE 96th Way.

At SE 96th Way, the proposed alignment follows the south side of SE 96th Way until it meets the I-90 right-of-way on the north side of the freeway.

Stewart and Gordon Residences

Where the alignment nears the I-90 right-of-way, the power line would travel between I-90 and two residences. An assessor's map identifies the properties as the Stewart and Gordon properties. This portion of the alignment would require the removal of approximately 50 feet of trees and the additional removal of potential "danger" trees, primarily deciduous cottonwoods.

The Stewart residence is more than 350 feet from I-90 and considerably lower than the elevation of the freeway. Much of the view of I-90 is obstructed by a natural berm/hillside and by trees and underbrush. However, there is a view of I-90 where the berm dips and the trees and brush thin out to provide a view of westbound traffic on the freeway. Figure 1 shows a truck traveling on I-90 that is visible from the Stewart property (the lighter region in the middle of the picture is the truck). At this location, approximately 50 feet of trees and shrubs would be removed for the power line.

Figure 1. View of I-90 from Stewart Property

The ISO 9613-2 dense foliage attenuation estimation suggests that 50 feet of dense trees and foliage would provide about 1dBA overall reduction in freeway noise, *assuming that the stand of trees is so dense that one can not see through it.* So removal of 50 feet of dense trees and foliage would result in approximately 1 dBA increase in freeway noise. However, since the stand of trees between the Stewart property and I-90 is not dense enough to completely block the view of traffic on the freeway, the noise increase due to the removal of the vegetation would be somewhat less than 1 dBA. Sound level differences less than 1 dBA, assuming that the noise source remains the same, are not detectable by people. Therefore, removal of the vegetation in this location would not result in a noticeable noise increase at the Stewart property. However, the vegetation creates a partial visual screen, especially in the spring and summer, which could provide some perceived benefit.

The Gordon property is approximately 400 feet from I-90 and east of the Stewart property. MFG did not have access to the residence and did not get a chance to see if I-90 was visible from the Gordon property. Looking east from the Stewart property, it appears that the forested area is more dense east of the Stewart property, and likely obscures any view of I-90. Similar to the Stewart property, approximately 50 feet of trees and shrubs would be removed for the power line between I-90 and the Gordon property.

Using the ISO 9613-2 dense foliage attenuation estimation, removing 50 feet of dense trees and foliage would result in an approximately 1 dBA increase in freeway noise, assuming that there is not currently a view of traffic on I-90 from the Gordon property. A sound level increase of 1 dBA would not generally be detectable given that the noise source would remain consistent.

Residences near 372nd Avenue SE

There are several residences near North Bend Way in the vicinity of 372nd Avenue SE, between 80 and 140 feet from the northern edge of North Bend Way. The proposed power line alignment would travel between these residences and North Bend Way, resulting in the removal of approximately 50 feet of trees in this location.

There is a high berm along North Bend Way providing some noise reduction from traffic on the roadway. Figure 2 shows the existing berm. The picture in Figure 3 was taken while standing on top of the berm. The bright spot on the left side of the picture in Figure 3 is North Bend Way. Figure 3 shows that the stand of trees that would be removed with installation of the power line is not dense enough or wide enough to provide substantial noise reduction from traffic on North Bend Way. Since the density of the trees would not fully block the view of traffic on North Bend Way, the removal of 50 feet of trees and brush would result in less than a 1 dBA increase in noise at these residences. This noise increase would not be noticeable. However, the vegetation creates a partial visual screen, especially in the spring and summer, which could provide some perceived benefit.

Figure 2. Berm at North Bend Way and 372nd Ave SE

Figure 3. View of North Bend Way and Residence

Residences Between 372nd Avenue SE and Meadowbrook Way SE

Several residences north of North Bend Way between 372nd Avenue SE and Meadowbrook Way SE could potentially be affected by the vegetation removal associated with installation of the power line. In these locations, approximately 50 feet of trees and shrubs would be removed from the north side of North Bend Way to accommodate the new power line.

Most of the residences along this portion of North Bend Way are located below the grade of the roadway. The pictures in Figures 4 and 5 (all taken from the right-of-way of North Bend Way) show that the trees are not dense enough or deep enough to block the view of traffic on North Bend Way from the residences. The house in Figure 4 is slightly below the grade of North Bend Way. The pond (the dark area visible through the brush) and clearing in Figure 5 are far below the roadway. This location is planned for construction of a residence sometime in the future.

Again, removal of 50 feet of the trees and brush would result in a noise increase of approximately 1 dBA, assuming that the trees and brush were dense enough to block all view of the roadway. Since portions of North Bend Way are visible from these residences, the noise increase due to removal of the vegetation would be less than 1 dBA. This noise increase would not be noticeable, although removal of the vegetation could result in a clearer view of traffic on North Bend Way and a perceived increase in the noise. As a note, most of the visual obstruction shown in the following pictures is due to brush and other low vegetation. In the spring and summer, it is likely that leaves on these plants would provide even more visual obstruction of North Bend Way. Although these bushes and other vegetation may need to be removed during installation of the power line, much of it will be replaced or may naturally regrow, again providing whatever visual benefit they currently provide.

Figure 6. View of Residence from North Bend Way

Figure 7. View of Pond (Future Residence) from North Bend Way

Residences on Alm Way

Several residences on Alm Way could potentially be affected by the installation of the power line due to removal of up to 100 feet of trees and vegetation between the residences and North Bend Way. Distances from potentially-affected residences to North Bend Way vary from 100 to 280 feet. The visibility of North Bend Way from the residences varies from a clear view of traffic

near the intersection of Alm Way and North Bend Way to very little visibility of traffic on North Bend Way as the residences become more distant from the roadway. Figure 6 is a picture taken from North Bend Way looking toward the residences on Alm Way. Several residences are visible, including through the existing trees. Figure 7 was taken in front of a residence located on Alm Way, more distant from North Bend Way. The railroad track between North Bend Way and Alm Way is visible in Figure 7; traffic on North Bend Way is more difficult to discern, but it was slightly visible.

The removal of 100 feet of dense trees and vegetation could lead to as much as a 2 dBA increase in traffic noise from North Bend Way, assuming that the vegetation is dense enough to completely obscure the view of traffic on North Bend Way. Since traffic on North Bend Way is somewhat visible, the actual increase in traffic noise at the most-affected Alm Way residences (those furthest east) would be somewhat less than 2 dBA. Such an increase would be difficult to discern in the active noise environment since the noise source would remain the same. Nearer the intersection of Alm Way and North Bend Way there is currently little vegetation between the residences and North Bend Way, and the project would not result in any increase in noise at these locations.

Figure 8. View of Residence on Alm Way from North Bend Way

Figure 9. View of Railroad Track and North Bend Way from Alm Way

Tanner Substation

In conjunction with the proposed installation of the 115 kW power line, a substation would be installed at the project terminus. The transformer proposed for the substation would emit a noise level of approximately 75 dBA at 2 meters according to the manufacturer's specifications. The proposed transformer is approximately 18.3 feet high, 11.5 wide, and 9.2 deep.

Sound levels from the transformer were estimated at several locations assuming only distance attenuation would serve to reduce noise from the transformer. The nearest property lines would be approximately 180 feet east of the transformer, 330 feet west, and 550 feet south. Alm Way borders the property to the north. Simple calculations assuming distance attenuation alone

resulted in estimated sound levels of 54, 48, and 44 dBA at the eastern, western, and southern property lines, respectively. As discussed previously in the section on noise regulations, the North Bend City Code specifies a maximum permissible noise level at these property line locations of 60 dBA.

The nearest residential district in North Bend to the substation site is approximately 790 feet to the north. The estimated sound level at this location is 41 dBA, easily meeting the North Bend noise limit of 57 dBA.

The nearest location in unincorporated King County to the substation site is rural property located approximately 1330 feet to the west of the site. The estimated sound level at this location is 37 dBA, easily meeting King County's noise limit of 55 dBA.

Conclusion

The increase in sound levels at all potentially affected residences due to the removal of trees and shrubs would not likely be discernable. Therefore, the project should not result in any significant noise impacts.

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Appendix C Mitigation Action Plan

Tanner Electric Transmission Line Project
Mitigation Action Plan

This Mitigation Action Plan identifies mitigation measures that BPA is committed to for the Tanner Electric Transmission Line Project. All measures were identified in the Environmental Assessment. They have been developed in coordination with environmental specialists, BPA's forester, design and construction engineers and maintenance personnel.

Much of the information contained in this plan would be included in the construction specifications for this project. Unless noted in the plan, the construction inspector (or line foreman, if constructed by BPA personnel) would be responsible for implementing the mitigation with help from environmental staff, who would also monitor the area for mitigation effectiveness.

Right-of-way clearing and access road construction would begin in the summer/early fall 2001. If you have any questions about the Mitigation Action Plan, please contact Gene Lynard at (503) 230-3790. If you have general questions about the project, including the construction schedule, please contact Kirk Robinson at (503) 230-5949.

Resource Category	Mitigation
Land Use	• BPA would compensate landowners for new right-of-way needed for the transmission line. Fair market value would be established in the appraisal process. • BPA would work with the landowners to site wood poles as well as the 500-kV steel structure that would be moved to accommodate the proposed crossing of the new line under the existing 500-kV transmission line near 96th Way.
Geology/soils	• Minimizing disturbance and erosion is a concern at all transmission pole sites, construction staging areas and where access roads would be built, modified or improved. By following best management practices (BMPs) for erosion, sediment and runoff control, impacts would be reduced or eliminated at all sites. These BMPs include: 1. Disturbed areas would be returned to their original contour and promptly seeded with a herbaceous seed mixture suited to the site. 2. Sediment barriers and other suitable erosion and run-off control devices would be installed where needed to minimize off-site movement of sediments. These erosion control services will be left in place until the site has been stabilized. 3. New access roads would be designed to control runoff and erosion. An integrated system of control, collection and dispersion of concentrated runoff would be installed on fill slopes, road surfaces, and natural slopes below cross drains and culverts. 4. When practical, construction activities would be avoided when soil is wet to reduce soil compaction, rutting and the resultant loss of soil productivity.

Water Quality	• BMPs to control erosion and run-off would be employed to eliminate or minimize water quality impacts. • Sediment barriers such as straw bales or silt fences would be used to prevent off-site movement of sediment. Devices would be left in place until the site stabilized. • Immediately following cessation of construction activities, disturbed areas would be seeded with a seed mixture suited to the site. Disturbed areas include areas affected by installation of the wood poles and where construction activities have affected vegetation adjacent to streams or wetlands. • Traffic in wet areas susceptible to rutting would be limited. • Streams would be crossed only at existing crossings. No fords would be constructed. • Any necessary culverts or other structures would be designed and installed to provide unobstructed stream flow and minimal change to the stream course. • If practical, construction activities would be timed to reduce erosion by conducting operations during low-runoff periods (April through mid-October). • Roads that would be used during wet periods (mid-October through March) would have a stable surface and sufficient drainage to allow such use with minimum impact. • Any gravel used for access road improvements near water bodies or wetlands would be clean. • Any damage to stream banks would be repaired and the site stabilized immediately following construction. • No solid materials, including building materials, would be discharged into surface waters.
Vegetation	• Clearing would be minimized. • Vehicles would not be allowed off roads at wood pole sites. • A noxious weed survey would be conducted before construction activities begin. Where noxious weeds have been identified, all construction vehicles would be washed before and after leaving project sites. Follow-up surveys would be conducted when construction activities end. • Disturbed areas would be re-seeded with appropriate herbaceous seed mix immediately following construction activities to guard against erosion, the proliferation of noxious weeds, and to preserve visual quality. • To reduce the chance of spreading the fungus disease to non-infected trees within the I-90 right-of-way, BPA would clear the trees and construct access roads during the dry season (April through mid-October).

Wetlands and Floodplains	• Transmission poles would be placed to avoid impacts to wetlands and floodplains. Wetlands would be spanned where practical. • BMPs would be employed to control erosion and runoff and to avoid adversely affecting wetlands and associated aquatic resources. • Vegetation not in roads and determined to be a hazard to transmission line safety and reliability will be removed through manual and mechanical methods. • Gravel would not be placed within wetlands unless necessary to access a work site. • Existing roads would be used where possible to provide access through a wetland. • Excavated material would not be disposed of within wetlands or wetland buffer areas. • At the proposed substation site, any soil removed for construction of the facility would be deposited in uplands. • Access roads would be located to avoid wetlands where practical. If access were required through wetlands, roads would be located to minimize impacts and constructed in compliance with all applicable permits.
Fish and Wildlife	• Work within the vicinity of all streams would be undertaken during periods of low flow, and any work within wetlands or wetland buffer areas would be done during the dry season (April through mid-October). • Tall growing vegetation that must be felled in wetlands would be left in place as wildlife habitat. • Snags would be left for wildlife habitat if it were determined that they would not interfere with the safe construction and operation of the line. • BPA's contractor and Tanner Electric would provide the appropriate erosion control devices to protect sediments from entering any wetlands or surface waters crossed by the proposed project. The erosion control devices would be left in place until the site becomes stable.

Visual Quality	• BPA would work with the City of Snoqualmie and the Quadrant Corporation in adding vegetation to the west side of the buffer area separating the Business Park from the affected landowners immediately east of the Business Park. • Vegetation would be planted along North Bend Way to partially screen those properties where the majority of vegetation would be removed between the residences and the county road, and where the visual impacts would be high. • BPA would work with the landowners along North Bend Way, at their request, to site the proposed wood poles so that the transmission line is least disruptive to their views. • BPA would retain the help of a plant specialist to assist with identifying the appropriate plant species that would reduce the visual impacts to the residents, Snoqualmie Valley railroad passengers, and I-90 travelers resulting from removal of tall growing vegetation. BPA would consult with the Greenway Trust before undertaking any plantings within the I-90 right-of-way. • Existing access roads would be used where possible. • All disturbed areas, including access roads in the I-90 right-of-way, would be re-seeded following the completion of construction activities. • No trees would be topped within the I-90 right-of-way at the request of the Washington State Department of Transportation. • Wood poles used would be darkened to reduce their visibility. • Non-reflective conductor would be used to reduce the line's reflectivity. • Trees removed from the state right-of-way would be disposed of according to the requirements of the state and Greenway Trust. • Trees removed form the county right-of-way would be offered to the adjacent landowners at no expense.
Socioeconomics	• BPA would compensate landowners based on any limitations of use or utility imposed by the right-of-way. Such limitations would be identified during the appraisal process.

Cultural Resources	• In the unlikely event that cultural resources are uncovered during construction, work in the immediate vicinity of the find would be halted. BPA would then consult with the State Historic Preservation Officer and other affected agencies or tribes to assess the significance of the find, and develop measures, if warranted, to mitigate any damage to the resource. Should any archaeological resources be identified, BPA would comply with the requirements of the Archaeological Protection Act of 1979, which protects archaeological resources on publicly owned and Indian lands.
Health and Safety	• The transmission line would be constructed so that two phases of the three-phase single-circuit transmission line would be placed on the south side of the line. This configuration would minimize the magnetic fields at the edge of the right of way for the residents located on the north side of North Bend Way.
Noise and Radio-TV Interference	• BPA would rectify any TV/radio interference by the proposed project, although interference is not anticipated.